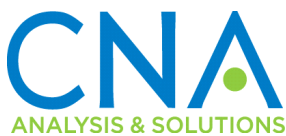


SECURITY PLANNING AND POLICIES TO MEET THE CHALLENGES OF CLIMATE CHANGE

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Climate Change as a Matter of National Security

Climate change poses challenges to societies and governments that go far beyond the alteration of our environment. The physical impacts of climate change, including gradual but steady increases in temperature, changing precipitation patterns, the reduction of glaciers and Arctic ice, rising sea levels and changes in coastlines, and more intense and frequent extreme weather events, will affect human lives in numerous ways. While climate change does not by itself create new security threats, it does act as a *threat multiplier*. It exacerbates existing political weaknesses and social tensions in countries around the world, and creates demands for state services and assistance—including security—which at times may exceed the capacity of governments to respond. In this sense, the growing likelihood of events such as mass migrations, crop failures, economic shocks, public riots and violence, floods and other natural disasters, widespread epidemics, and competition for resources pose serious challenges for governments and security forces worldwide.

The Implications of Climate Change for Colombia's National and Regional Security

A 2009 CNA study found that Colombia, due to its geographic diversity, will likely experience an array of environmental changes related to climate change.¹ The extent and diversity of the impacts are a function of Colombia's extensive coastlines and the reliance of the great majority of its people and industries on river systems and high-altitude water resources. Over the next 40 years, extreme weather events, including floods and droughts, will become more frequent and intense and will occur in areas of the country where they have not before. El Niño/La Niña cycles and their effects will likely intensify. Changes in rainfall patterns are extremely difficult to predict, but in general forecasters believe that traditionally rainy areas will receive more rain and drier areas less. Many effects of climate change will be most pronounced in the mountains, where warmer and dryer air will further reduce the *páramos* (mountain wetlands), reducing a chief source for many of the country's major river systems, and Colombia's glaciers will continue to melt. Soil degradation caused

¹ Catarious, D., Espach, R. (October 2009). *Impacts of Climate Change on Colombia's National and Regional Security*, CNA Research Memorandum number D0021520.A1/Final. Available in English and Spanish at: www.cna.org.

by higher temperatures and drier air will impact major agricultural zones, particularly in the Caribbean region. Sea level rise could inundate areas of economic, cultural, and military value, especially at Cartagena and the San Andrés Islands.

As a threat multiplier, climate change is likely to worsen problems that Colombians have faced for decades (e.g., drug trafficking and crime, natural disasters, and forced migration or displacement). Among the most critical future security challenges the study identified are:

- **Natural disasters of increased frequency and intensity.** These include floods, droughts, wild fires, and (for the Caribbean coast) tropical storms. These impacts will increasingly overlap, having potentially severe humanitarian and economic effects.
- **Conditions conducive to illegal activities, fueling crime and violence.** Climate-driven shocks to agriculture, industry, and communities can cause misery, mass migration, and social disorder which illegal groups can exploit for recruitment.
- **Extensive human displacement.** Natural disasters and climate driven changes in industry and agriculture can cause displacement, both domestic and international.
- **Growing pressure on the military's operations and resources.** Damage to military infrastructure (especially along sea and river coasts) and increasing humanitarian missions will serve to divert resources from other missions and operations.

Climate Impacts across South America and Related Security Issues

Across South America, climate projections indicate that temperatures will continue to rise gradually, by approximately 2°C to 4°C on average by 2040 (assuming no significant change in global emissions trends). Differences in latitude, local geography, and prevalent wind and weather patterns will significantly affect actual temperatures at the local level. Projections indicate, however, that the highest temperature rises are likely to occur in the Amazonian region of north Brazil, Guyana, and Venezuela, and the savannahs of east Colombia and southwest Venezuela. Heat waves are expected to become increasingly common, especially in the southeastern area of the continent.

The intensity and frequency of precipitation is also likely to change. Rainfall is expected to increase in the eastern Amazon basin, along the Colombian, Ecuadoran, and north Peruvian Pacific coasts, and in south Brazil, Uruguay, and northern Argentina. Rainfall is expected to drop significantly in the eastern Amazonia and northeast Brazil, and the central-northern parts of Chile. Continuous dry spells are likely to increase across South America (except for northeastern Peru, Ecuador, and western Colombia).

Likely effects for the region's population include:²

- **Reduction of freshwater resources.** Climate change will generally reduce freshwater resources in areas of Argentina, Chile, Brazil, Ecuador, Bolivia, and Peru as a consequence of changes in precipitation, rising temperatures and increased demand. This could have major negative consequences principally for agricultural production and the use of hydroelectric dams (particularly in the Andean countries and in the subtropical region of South America, which are highly dependent on hydroelectric energy). In addition, many of the region's glaciers will shrink or could even disappear entirely by 2050. In the short term water availability downstream will increase, but with more volatility in the flows. The long term equilibrium, however, is for significant declines in the river systems fed by high-altitude glaciers and *páramos*.
- **Challenges to some crops and agricultural regions.** The impacts of climate change in the agricultural sector differ by crop, region, type of land required, and economic policies. In general, high-altitude crops are likely to be more affected, as are agricultural zones along the Caribbean coast. Some crops and regions, however, are likely to be positively affected, especially in the southern end of the continent. These trends will be shaped also by the spread of new plant diseases and weeds.
- **The spread of heat-related and vector-borne diseases.** Though projections differ, and future impacts will be affected a great deal by public policies, it is widely expected that malaria, dengue fever, cholera, and respiratory illnesses are all likely to become more widespread under climate change.
- **Rising sea levels will have major economic effects.** Communities along the coast, including major urban areas such as Buenos Aires, will bear the brunt of these impacts. In some countries, major tourist destinations and industrial, commercial, and military infrastructure could be threatened. The disappearance of mangroves in lower coastal areas (e.g., the northern coasts

² These are summaries of overlapping findings from various reports. For the most recent and a nicely comprehensive report, see Barcena, Alicia, et al. *Economics of Climate Change in Latin America and the Caribbean*, ECLAC/United Nations, November 2009.

of Brazil, Colombia, Ecuador, French Guyana and Guyana), as well as coastal flooding and land erosion, will negatively affect fishing stocks and other coastal economic activities.

- **Increases in the frequency and intensity of extreme weather events.** Flooding, droughts, tropical storms, wild fires, and other extreme events are likely to increase in the coming decades, and the El Niño-La Niña cycle may intensify.
- **The loss of biodiversity.** Climate change will cause significant, often irreversible, losses in biodiversity, which is particularly serious in a region that encompasses the world's largest tropical rainforest and several of the most biodiverse regions in the world.

The Implications of Climate Change for Regional Security

Countries across South America face the potential for further security challenges similar to those anticipated for Colombia owing to the impacts of climate change. These include mass migration as people along the coasts or dependent on high-altitude water resources find it impossible to maintain their livelihoods; energy and food shortages; human misery caused by storms and the spread of disease; and economic hardship caused by the lack of public funds necessary to address all these problems.

Many countries in the Andean region already struggle against the trafficking of drugs, weapons, contraband, and humans, and the violence and corruption that these activities generate. The follow-on effects from climate change are likely to make these problems worse. Some of the regional security problems that are most likely to derive from climate change, and to impact Colombia, include the following:

- **High demand for international emergency response.** It is possible that countries like the United States, Colombia, Brazil, and Chile, with their larger economies and budgets and greater infrastructural and military capabilities for emergency response operations, will be called upon to assist their neighbors when crises occur.
- **Large-scale refugee flows could occur following disasters such as droughts or floods.** In addition, such flows could be driven by political or ethnic conflicts that could arise due partly to resource competition. While most of these flows are likely to be domestic, from rural to urban areas, some may be transnational.

- Social stress could lead to political tensions. Under some circumstances climate-induced crises such as droughts or famines may combine with conditions of intense social division or nationalism to spark international tensions.
- **Humanitarian and economic crises facilitate illicit activities.** Around the region these economic and social difficulties will provide conditions that favor illicit activities such as the trafficking of drugs, humans, and other contraband, with their accompanying social and economic costs.
- **Limited public resources for response.** Regional governments will have to take measures to mitigate the effects of climate change (e.g., building and repairing dams, ports, power plants, etc.) that will likely outstrip available financial resources, both domestic and international. These burdens will reduce the regional capacity for emergency response and other security-related missions.

Meeting the Challenges of Climate Change

Climate change presents a host of economic, public health, and security challenges to the countries of South America. Successful response—both preventative and adaptive in nature—will require leadership, innovation, a sustained commitment of resources, and concerted action between various government agencies and their respective militaries. Proactive planning and actions are necessary to reduce the likelihood of the occurrence of the worst potential effects; otherwise, future crises could rob governments of legitimacy and threaten regional security. Civilian agencies will lead most efforts related to climate change adaptation, but many governments will likely leverage their militaries to improve national climate change resilience. Thus, climate change response efforts should reinforce the concept of military support to civilian authority, promote interagency collaboration, and facilitate international cooperation whenever appropriate or required.

These issues will be discussed at a roundtable on 26-27 of July in Bogota, Colombia, hosted by the Colombian Ministry of Defense, the U.S. Southern Command, the U.S. Army War College, and CNA (a Washington-based center for policy-relevant research and analysis).

- Identify and discuss the security challenges that climate change poses for South American countries;
- Share best practices for security policies and planning aimed at addressing these challenges;

- Determine appropriate and effective areas and means for civilian-defense cooperation to strengthen national and regional resilience;
- Enhance regional capacities for international cooperation;
- Define local and national strategies for effective cooperation among governments, security forces, and non-governmental organizations in planning for climate change response.